INTRODUCTION

Radioactive material has been safely transported in this country for over 50 years. Package marking, labels and vehicle placards are used to identify shipments of radioactive material.

In this module you will learn more about the various communication requirements used by shippers of radioactive material. These communication requirements are designed to inform you of a package/vehicle's radioactive contents.

PURPOSE

The purpose of this module is to increase your understanding of package markings, warning labels and placards used for packaging and shipping radioactive material.

Your ability as a responder to recognize and interpret package marking, labeling, and vehicle placarding will help you function safely during incidents involving radioactive material.

MODULE OBJECTIVES

Upon completion of this module, you will be able to:

1. Identify markings on packages used to transport radioactive material.
2. Identify labels on packages/containers used to indicate the presence, or absence, of radioactive material.
3. Identify vehicle placards used on radioactive material shipments.

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RADIOACTIVE MATERIAL: Shipping and Packaging Concerns

Safe Packaging

Radioactive material is transported every day by highway, rail, air, and water. To ensure the safety of people and the environment, radioactive material is packaged carefully. Packaging standards are rigorous and standardized in an effort to keep package failure from occurring when radioactive material is transported.

Radioactive material is packaged to ensure that radiation levels at the package's surface do not exceed the limits specified in federal regulations. This ensures that no one is exposed to radiation levels exceeding recognized safe limits.

Prior to transport, regulations require that radioactive material be properly packaged, sealed, surveyed for external radiation, and then checked for external contamination. The package is then marked and labeled (as required) to communicate specific information about its contents.

Package Markings

Not all radioactive material shipping packages require package markings. Smoke detectors, for example, have such low levels of radioactivity that they are excepted (excluded) from federal regulations requiring package markings. When marking is required, packages will be clearly marked on the outside of the package.

Package markings are designed to inform transportation workers and emergency response personnel about the package's radioactive contents. Some of the markings you may see on a radioactive material package include the following:

- Proper Shipping Name and UN identification number (e.g., radioactive material, n.o.s.[1] UN 2982)
- "Type A" or "Type B"[2], as appropriate
- Gross weight, if package weighs more than 110 lbs.
- "USA" if package will be exported
- Orientation arrows. This is a good indication that the package contains liquids (*see figure below*)

[1] n.o.s. is an acronym for "not otherwise specified."
[2] Type A and Type B refer to specific types of radioactive material packaging. Refer to the glossary of terms for more information on Type A and Type B Packages.

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Radiation-warning Labels

Like package markings, radiation-warning labels are designed to inform transportation workers and emergency response personnel about the package's radioactive contents. Not all radioactive material packages require labels. Some low-level radioactive material is excepted from federal regulations that require radiation-warning labels. When radiation-warning labels are required, they will appear on two opposite sides of the package and will contain specific information about the nature of the radioactive material contents.

The shipper applies radiation-warning labels to radioactive material packages based upon Department of Transportation (DOT) regulations. These regulations govern external radiation levels or, in some cases, the type and quantity of radioactive material contained in each package.

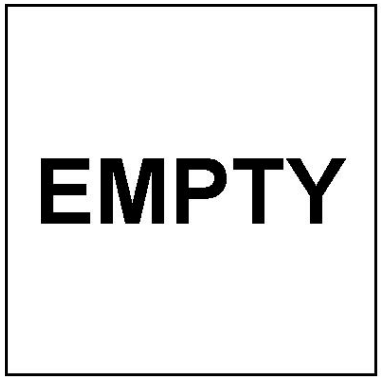
The following labels may be used on packages used to transport radioactive material:

Radioactive White-I: minimal radiation levels detectable outside the package

Radioactive Yellow-II: medium-level radiation levels detectable outside the package

Radioactive Yellow-III: highest radiation levels detectable outside the package

EMPTY: applied to packages that have been emptied of their contents as far as practical but may still contain regulated amounts of internal contamination and minimal radiation levels detectable outside the package



In a response situation, if you encounter a package that has a radiation-warning label on it, carefully note the specific label. Also note any other information or markings on the package. Write all the information down and be certain of its accuracy. As with all hazardous material, you need to have as much information as possible in a response situation.

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Placarding Requirements

Not all shipments of radioactive material require that the transport vehicle be placarded. Rail or highway shipments containing excepted quantities and packages with the EMPTY, Radioactive White-I, and Radioactive Yellow-II labels do not require vehicle placarding. When required, placards must be in plain view and displayed on all four sides of the transport vehicle.

The standard placard for radioactive material is yellow on top and white on the bottom, with black lettering and a black radiation symbol in the yellow portion. Standard size is approximately 10 x 10 inches. In the bottom corner, the DOT hazard classification number "7" denotes radioactive material.

There is one other type of radioactive placard that you may encounter on highway shipments. It looks very similar to the standard placard, except that it has a white square background and a black border. This placard represents a "Highway Route Controlled Quantity" (HRCQ) shipment. HRCQ shipments contain higher quantities of radioactive material and require special controls during transport. Special controls include operating highway vehicles over "preferred routes."

A preferred route is the Interstate Highway system or a state-designated alternate route selected by a state agency. The driver of a HRCQ vehicle must be provided with a written route plan, must have received DOT mandated training within two years prior to the shipment, and must have a certificate of such training in his possession during the shipment.

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United Nations Identification Number

In addition to the radioactive placard, the vehicle may also have a United Nations Identification Number (UN ID) on an orange panel close to the placard. The panel is orange with black lettering and has a four-digit identification number that identifies the radioactive material. This four-digit number is the UN identification number of the material being transported. The orange panel is used because UN identification numbers may not be displayed on a Class 7 placard. The UN identification number can be used to locate the name of the material and the response guide in the Emergency Response Guidebook (ERG).

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Secondary Hazards

One thing responders should always be alert for is the presence of secondary hazards at an incident site. These secondary hazards can come from two possible sources, other hazardous material carried on the vehicle or external factors such as downed power lines, spilled fuel, etc. If you observe a radioactive placard, do not let this distract you from looking for additional placards on the vehicle. Be aware that some radioactive material may have other hazardous properties. For instance, they may be contained in a compressed gas or contain corrosive chemicals.

Remember that radioactive placards may not indicate the only hazard(s) on the vehicle. Don't get "tunnel vision" about radiation; it is important to look for spilled fuel, downed power lines, etc., since these may pose a more immediate hazard than the radioactive material.

Check Your Understanding

1. Package _____ are designed to inform transportation workers and emergency response personnel about a package's radioactive contents.

2. Orientation arrows on the outside of a package are a good indication that the package contains _____.

3. All packages of radioactive material require radiation-warning labels. True/False.

4. Which of the following is true regarding the use of radiation-warning labels?
   a) Radiation-warning labels are only used on medical shipments
   b) When required, they will appear on opposite sides of the package
   c) All shipments of radioactive material require radiation-warning labels
   d) Radiation-warning labels are placed on vehicles transporting radioactive material

5. The _____ label is applied to packages that, after being emptied of their contents, still contain a regulated amount of internal _____.

6. Placarding is required on all shipments of radioactive material. True/False.

7. The standard placard for radioactive material is _____ on top and _____ on the bottom, with black lettering and a black radiation symbol. In the bottom corner, the DOT hazard classification number __ denotes radioactive material.

ANSWERS

1. markings
2. liquids
3. False
4. b
5. empty
   contamination
6. False
7. yellow
   white
   7

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